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Research Article

Development of Oro-Dispersible Tablet of Meclizine by Using Different Superdisintegrating Agents

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Abstract

The proposed study is development of oro-dispersible tablet containing meclizine hydrochloride solid dispersion (FMODDs) formulation with using natural superdisintegrant with direct compression. The superdisintegrants and its concentration shall be during the preparation of FMODDs with meclizine hydrochloride by using direct compression via employing different excipients in different ratio including: superdisintegrants {sodium starch glycolate (SSG), Ac-Di-Sol, crosspovidone (CP), Spray dried lactose and microcrystalline cellulose (MCC)} which were used alone and in various combination and mannitol, along with lubricant and glidants. The object of proposed work was preparation of FMODDs with a short disintegration time, sufficient mechanical strength, better patient compliance, and acceptable stability profile by employing different methods of preparation and studying different variables affecting pre and post-compression parameters of formulas of meclizine hydrochloride. The combination of agents have more disintegrating property due to rapid water uptake and dispersion time which lead to rapid release of drug and made the dissolution faster. The results of the release kinetics study showed that all the formulations obeyed first order drug release profile more closely, i.e., the release rate depended upon the initial concentration of drug.

Keywords: Solid dispersion, Oro-dispersible, Fast disintegration, Direct compressed tablet, Meclizine hydrochloride, Superdisintegranting agents

INTRODUCTION

To improve bioavailability and patient compliance, orodispersible drug delivery systems are widely used because Orodispersible pills are a novel form of dose that disperses rapidly in the mouth without chewing when administered orally and without the need for water. Orodispersable tablets (ODTs) are defined as a solid dose form containing a drug substance that dissolves within a matter of seconds when placed on the tongue[1]. The composition of ODTs has interesting features such as the special ability to hide the taste of a very low dispersion, as well as a pleasant mouth feeling. Drugs are absorbed into the mouth, pharynx and esophagus as saliva flows down the stomach and in such cases the bioavailability of the drug increases, premature absorption can result in improved bioavailability) and due to reduced dose, improved clinical performance. by reducing unwanted effects[2]. ODT technology is new to the industry and has had a profound impact on patients of all ages and concealing flavor is an essential ODT requirement for commercial success. Concealing the taste of bitter or unpleasant drugs is important in any form of oral administration[3]. Direct pressure technology is an easy way to make pills. Ordinary equipment, commonly available auxiliary equipment and a limited number of processing steps are involved in direct compression. Disintegrants play a major role in the dispersing and disintegration of Mouth Dissolving Tablets made by direct pressure[4]. To ensure a high level of dispersion, choosing the right type and the total amount of disintegrant is important. Other structural elements such as soluble compounds or soluble agents may enhance dispersion or dispersion features. But the main drawback of using effervescent excipients is their very hygroscopic nature[5]. The aim of the present study is to improve the structure of the oro dispersible tablet as a model drug using a natural superdisintegrant for direct or indirect congestion. In the current study there are four natural superdisintegrants and their focus will be on ODT preparation. Superdisintegrants are primarily needed to quickly eliminate or disperse pills for this purpose. Natural superdisintegrants are natural and preferred over synthetic materials because they are relatively cheap, widely available, non-irritating and non-toxic in nature. The benefits of oro dispersing dosage forms are increasingly being recognized in both, industrial and academic. Therefore, the present study is based on the use of a natural superdisintegrant with direct or effervescent pressure or sublimation method[6-7]. Meclizine Hydrochloride is used as an anti-vertigo drug to control the symptoms of vertigo and imbalance. Meclizine is an antihistamine agent with antiemetic and antispasmodic properties. Antihistamines work by reducing the effect of histamine, a chemical produced in the body in response to allergies, and interfering with the effects of histamine such as narrowing of the airways, vasodilation and dilation of blood vessels. Meclizine suppresses the central nervous system by its anticholinergic effect on the neurotransmitter Acetylcholine. Meclizine hydrochloride (MHCl) is an antihistamine drug used to prevent and treat nausea and vomiting associated with a variety of conditions including motion sickness and treatment that is symptomatic of vertigo caused by ménière syndrome and an overactive sensory response. The drug should be taken early, thereby improving patient compliance, improving bioavailability and

lowering the dose. The Oro-dispersible tablet is defined in the form of direct pressure that uses super disintegrates at various levels. The Oro-dispersible tablet is made in the form of direct pressure using super disintegrants at a different rate.

MATERIAL AND METHODS:

Materials: Drug: Meclizine hydrochloride, superdisintegrants {sodium starch glycolate (SSG), crosscarmellose sodium (CCS), crosspovidone (CP), and microcrystalline cellulose (MCC)} which were used alone and in combination, diluents: lactose, granulated lactose, and mannitol, along with lubricant and glidants.

Methods:

Preliminary studies: The drug samples will be use for determination of absorption maxima (λmax) in various solvents i.e. 0.1N HCl solution. The analytical method was evaluated with preparation of calibration curve. The concentration of aliquates was 5 µg / ml, 10 µg / ml, 15 µg / ml, 20 µg / ml respectively. The absorbance of each solution was measured separately at 234 nm, for artificial saline salivary solution pH 6.8 respectively for drug. The absorbance was measured and standard curve was plotted between absorbance vs. concentration at 234 nm.

Characterization of the Drug: The drug will be characterized by organoleptic properties, microscopic examination by using phase contrast microscope. The physical characteristics of drug samples i.e. density, particle size, flow properties, compatibility, solubility in various dissolution medias, partition coefficient and drug-excipients compatibility by UV Spectroscopy, FTIR etc. The organoleptic properties of drug were evaluated visual organs i.e. color, odor and taste. The microscopic examination of the drug identified as a pinch of powder was spread on a glass slide and examined under optical microscope. The structure of drug was crystalline in nature. The average particle size (d_{avg}) of drug was determined by means of optical microscope (66172/Olympus, 100 X, Olympus (India) Pvt. Ltd., New Delhi) fitted with ocular micrometer and stage micrometer. The flow properties of drug powder were characterized for identification of flow character of powder in terms of carr's index, hausner's ratio and angle of repose. The solubility of drug was determined in distilled water, 0.1N HCI, ASA pH 6.8 and phosphate buffer pH 7.4 by incremental solvent method. The partition coefficient of drug was determined in n-octanol: artificial saliva solution pH 6.8 solution. FTIR spectra of pure drug Meclizine hydrochloride was recorded by suspending in liquid paraffin and placing in sodium chloride cell on FTIR spectrophotometer (IR Affinity, Shimadzu, Japan). The peaks were determined and observed peaks were compared with standard[8].

Formulation of Orodispersible Tablets: These types of formulations solid dosage forms as tablets of model drugs have to be prepared by different methods (Direct compression).

Solid dispersion method using sugar derivative as mannitol: The solid dispersion of drug was prepared by weighed amount of drug was dissolved in ethanol and mannitol in different ratios (1:1, 1:2, 1:3 w/w) was added to this drug solution (in ethanol) and mixed on Vortex shaker (Electro Lab, India) for one hour. The solvent was evaporated in hot air oven at 45°C until dry. The solid dispersion was collected and ground using mortar and pestle and then sieved through mesh #18. This dried solid dispersion was used for further evaluation study[9].

Evaluation of meclizine hydrochloride solid dispersion (MSD1 – MSD3)

Physical appearance: All the batches of meclizine physical mixture and solid dispersions were evaluated for color and appearance.

Solubility studies: The solubility of drug was determined in distilled water, 0.1N HCI, ASA pH 6.8 and phosphate buffer pH 7.4. A accurate weighed 25 mg drug was kept in conical flask and required quantity upto 50 ml were kept in burrete. Now start the addition of 5 drops to conical flask containing drug. The conical flask regularly shaking and the amount of dissolution media noted, at which the drug was solubilized and kept for shaking at 37°C for 24 h in orbital shaking machine. Aliquots were filtered through whatman filter paper and the solubility of drug was calculated with unit mg/ ml.

Differential Scanning Calorimetry (DSC): Pure drug (Meclizine hydrochloride (MHCl), solid dispersion (5-10 mg) was heated in hermetically sealed aluminium pans with a heating rate of 10°C/min under nitrogen atmosphere (flow rate 20 ml/min) and thermograph were recorded using differential scanning calorimeter (Perkin-Elmer DSC7, USA).

SEM studies: The physical mixture and solid dispersions were evaluated for their physical structural changes in the surface topography of the drug particles by scanning electron microscopy (SEM) technique.

Percent practical yield: Percent practical yield was calculated to know about percent yield or efficiency of the any method thus it helps in selection of appropriate method of production. Physical mixture / Solid dispersions were collected and weighed to determine practical yield (PY) from the following equation:

$$PY\ \% = \frac{\text{Practical mass}}{\text{Theoretical mass (drug + carrier)}} * 100$$

Formulation of Meclizine hydrochloride Orodispersible Tablets: Meclizine hydrochloride orodispersible tablets (FMODs1- FMODs3 formulas) are prepared in the form of direct pressure according to the given formulas (Table 1). The developed active ingredient content was MSD3, which contains the drug: mannitol (1: 3) solid dispersion rate. The equivalent dose of 25mg provides for the strong dispersion of MSD3 with about 80 mg total weight of powder. The process is as follows: All ingredients (excluding lubricants and glidant) were passed through a sieve mesh # 40 meshes separately. It is then measured and mixed in a geometric pattern for about 10 minutes. Then lubricants and glidant are added to the mixture and mixed for about 2 minutes. Eventually the precise weight of the compound was pressed into 200 mg tablets using an 8 mm punch tablet press.

Table 1: Preparation of MSD3 containing Orodispersible Tablets

Ingredients (in mg)	FMODs1	FMODs2	FMODs3
Meclizine solid dispersion equivalent to 25 mg (MSD3)	90	90	90
Sodium starch glycollate	20	40	30
Ac-Di-Sol	40	20	30
Crosspovidone (5%)	10	10	10
Spray dried lactose	150	50	75
Microcrystalline Cellulose PH 102	0	100	75
Magnesium stearate	5	5	5
Purified talc	5	5	5
Total amount (g)	320	320	320

Evaluation of Orodispersible Tablets: The prepared **FMODs** will be evaluated for thickness of tablets, uniformity of weight, hardness, friability, disintegration time, water uptake percent, swelling studies, rupture test, drug content, in-vitro drug release study[10].

Flowability: The flow properties of drug powder were characterized for identification of flow character of powder in terms of carr's index, hausner's ratio and angle of repose. The Carr's index ((I_C)) and Hausner's ratio (H_R) of drug powders were calculating according to following equation:

$$\text{Carr's Index } (I_C) = \rho_{Tapped} - \rho_{Bulk} / \rho_{Tapped}$$

$$\text{Hausner's ratio } (H_R) = \rho_{Tapped} / \rho_{Bulk}$$

The angle of repose (θ) was measured by fixed height method. This was calculated by following equation:

$$\text{Angle of repose } (\theta) = \tan^{-1} 2\,H / D$$

Where H is the surface area of the free standing height of the powder pile and D is diameter of pile that formed after powder flow from the glass funnel.

Tablet Thickness and diameter: Ten tablets from each formulation were taken randomly and their thickness was measured with a digital vernier caliper**.**

Tablet Weight variation: Twenty tablets were selected randomly from each formulation and weighed individually. The individual weights were compared with the average weight for the weight variation.

Tablet hardness: The test is done using hardness tester (Erweka TBH 320) and the hardness was expressed in kg/cm^2 as a force required crushing the tablets. The mean of six determinations was used ± SD 10.

Tablet friability: Twenty tablets were weighed and placed in a Roche friabilator and the equipment was rotated at 25 rpm for 4 min. The tablets were taken out, dedusted and reweighed. The percentage friability of the tablets was calculated using equation:

$$\% \text{ Friability} = \frac{\text{Initial weight} - \text{Final weight}}{\text{Initial weight}} \times 100$$

Drug Content Uniformity: One tablet of the all formulation was placed in 100 ml volumetric flask, 50 ml of ASS (pH 6.8) was added, shaked by mechanical means for 30 min., ASS (pH 6.8) added to volume, filtered, diluted suitably, and finally the quantity of meclizine hydrochloride in the tablet was measured spectrophotometrically at λmax of 234 nm.

In vitro Disintegration Test: The artificial saliva solution (ASS) was prepared of 0.426 g disodium hydrogen orthophosohate, 1.680 g Sodium bicarbonate, 0.147 g calcium chloride, 1N hydrochloric acid to adjust pH to 6.8, and distilled water up to 1L. The in vitro disintegration test was done for all formulation at 37°C using artificial saliva solution (ASS) as a dissolution medium for the test. Disintegration apparatus with a basket rack assembly containing six open ended tubes and 10-mesh screen on the bottom was used. A tablet was placed in each tube of the basket and the time required for complete disintegration of the tablets with no palpable mass remaining in the apparatus was measured.

Wetting time and Water absorption ratio: The evaluation of such parameters, the method was slightly modified by using artificial saliva solution as a medium. A piece of tissue paper folded twice was placed in a small Petri-dish (internal diameter = 6.5 cm) containing 10 ml of ASS and 0.05% w/v amaranth solution (coloring agent). A tablet was placed on the tissue paper and the time required for complete wetting of the tablets was recorded as **wetting time**. The mean of three determinations was used ± SD 13. The same procedure of wetting time test was followed for determining the **water absorption ratio** (WAR) and it was determined according to the equation:

$$WAR = [(Wa - Wb) / Wb] \times 100$$

where, Wb and Wa were the weights of the tablets before and after the test.

In vitro Dispersion Time: Dispersion time is very important for orodispersible tablets which are desired to be less than one minute for orally dispersible tablets. This rapid disintegration assists swallowing and also plays a role in drug absorption in buccal cavity, thus promoting bioavailability. In vitro dispersion time was measured by dropping a tablet in a small beaker containing 6ml of ASS (pH 6.8) and agitated mildly. The time required for complete dispersion of tablets as fine particles was noted as dispersion time.

In vitro Dissolution Studies: In vitro dissolution studies were performed for the formulation containing meclizine (25mg) by using type I (Basket) dissolution apparatus at 100 rpm, and 900 ml of ASS (pH 6.8) was used as a dissolution medium. Temperature of dissolution medium was maintained at 37±0.5°C. Five ml aliquot of the dissolution medium was withdrawn at specific time intervals and replaced by fresh ASS (pH 6.8) solution. The aliquot was filtered and diluted suitably and then analyzed spectrophoto-metrically at the λmax of 2342nm.

In vitro kinetic Studies: To analyze the in vitro release data, various kinetic models including (zero order, first order, Higuchi, Korsmeyer-Peppas model, and Hixson-Crowell cube root law) were used to describe the release kinetics. The time required for 80% of drug to be released (t80%) and percent drug dissolved in 2 minutes (D2min) were considered for comparing the dissolution results.

RESULT AND DISCUSSION

Meclizine Hcl drug was analytic validated by UV spectrophotometric methods and drug was estimated in the dissolution medium ASS pH 6.8 phosphate buffer solutions. The calibration curves in the dissolution medium ASS pH 6.8 phosphate buffer solution prepared with drug solutions of known concentrations. The absorbance of each solution was measured separately at 232 nm, for ASS pH 6.8 phosphate buffer solution of drug The absorbance was measured and standard curve was plotted between absorbance vs. concentration. The calibration curves show excellent linearity of data as evidenced by the values of correlation coefficients that were found to be greater than 0.99 **(Figure 1)**

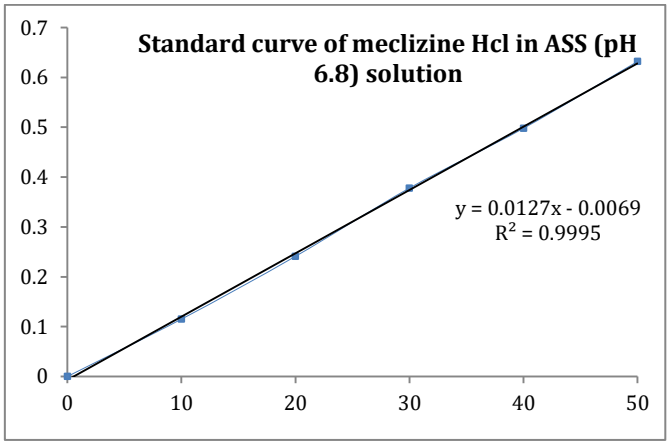

Figure 1: Standard curve of drug in ASS (pH 6.8) solution (234 nm)

Pre-formulation Studies: Pre-formulation studies are important task for development of dosage forms of model drug substances. The overall objective of preformulation studies is to produce information constructive to the formulator in development of stable and bioavailable dosage forms. Drug was found to be slight yellow, specific odorless, tasteless in nature. The microscopic examination of the drug sample was crystalline powder. The drug powder bulk and tapped densities to be 0.311 gm / cm^3 and 0.328 gm / cm^3, respectively. The particle size of unmilled powder was 113 µm. The flow of unmilled drug powder was good to excellent flow characteristics. The solubility of drug was very less soluble in all dissolution media. The partition coefficient of meclizine Hcl was found to be 5.2 and the value of partition coefficient of drug showed that the drug was lipophilic in nature. The Infrared spectra were obtained using an FTIR spectrometer. The blend was filled in amber color glass vials and stopped with grey rubber stoppers followed by aluminium seal. IR spectrum of Meclizine HCl is characterized by 2420cm-1 (–NH3– stretch), 2300cm-1 (CH2–CH2), 1450cm-1 (C = C stretch), 1080-1 (C–N stretch), 910 cm-1 (C–Cl stretch). No significant alterations in the IR bands of the pure drug were detected in the physical mixture.and passed through sieve # 40, mixed well. The FTIR spectrum is shown in **Figure 2 to 3**.

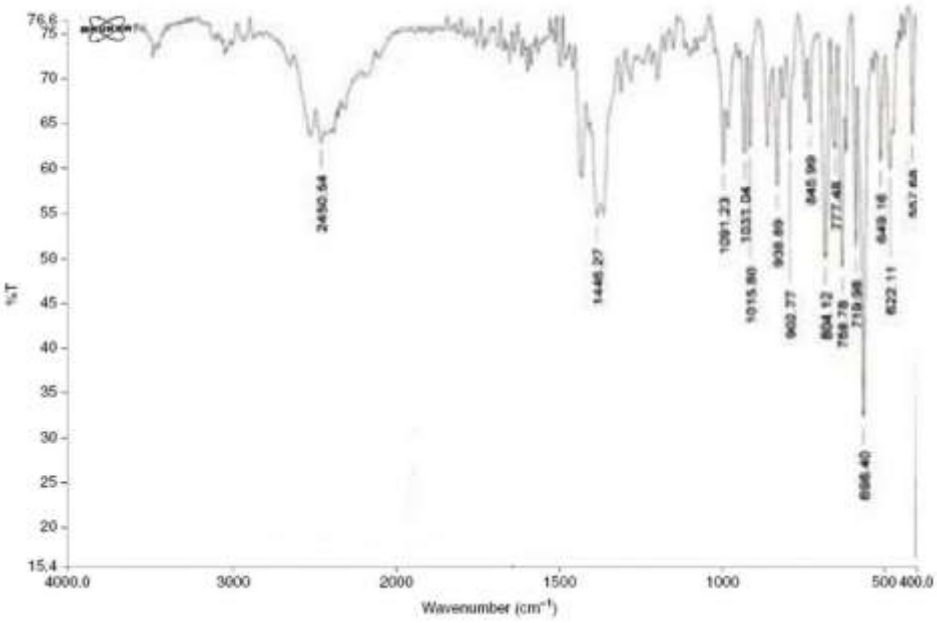

Figure 2: The I. R. Spectrum of drug sample (S1)

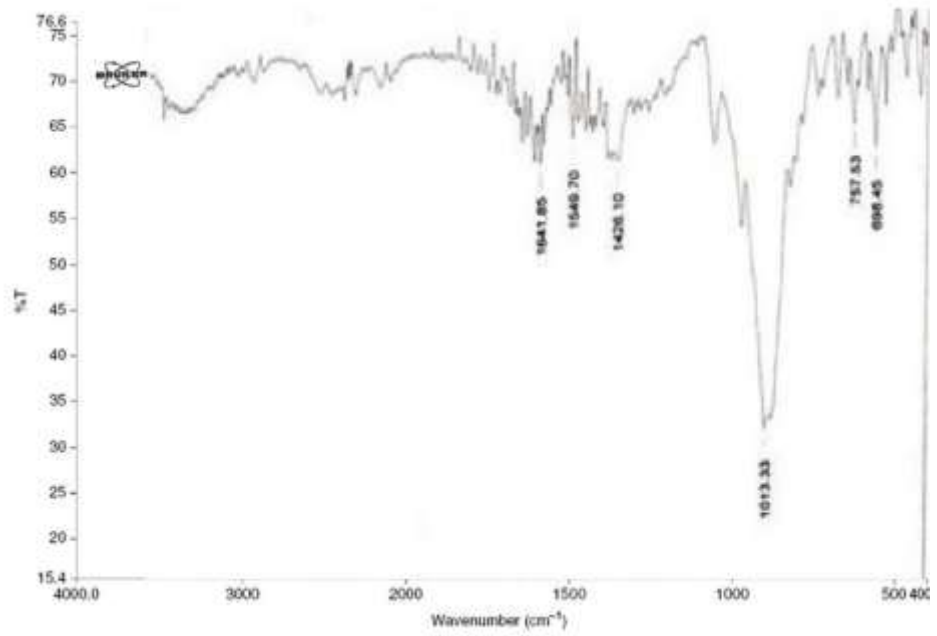

Figure 3: The I. R. Spectrum of drug and all excipients (S2)

Characterization of drug solid dispersion: The physical appearance and color of prepared solid dispersion powders was granular product in appearance and off-white in color. The solubility studies were conducted in different media for all the prepared solid dispersions and compared with pure drug. From the solubility studies, it was found that as the increase in pH of the media increased the solubility i.e. MSDs showed greater solubility in ASS phosphate buffer pH 6.8. The

solubility data of different formulations showed in **Table 2**. From the results, solid dispersions with 1:3 ratio with mannitol showed grater solubility when compared to other, by increasing the carrier concentration the solubility also increased proportionally. From all the above formulations, MSD3 formulation showed highest solubility in ASS phosphate buffer pH 6.8. The percent practical yield obtained for formulation SD1, SD2 were 90.12 - 98.23% respectively. The DSC thermogram of mannitol showed sharp endothermic peak at 171.12°C and meclizine mannitol solid dispersion shows two endothermic peaks corresponding to the melting point of drug and mannitol indicating no chemical interaction between them **(Figure 4 – 5)**. The SEM photographs describes that levocetirizine are small crystalline structure but its original one was totally amorphous and no sign of crystallinity was observed in SEM photographs **(Figure 6 – 7)**.

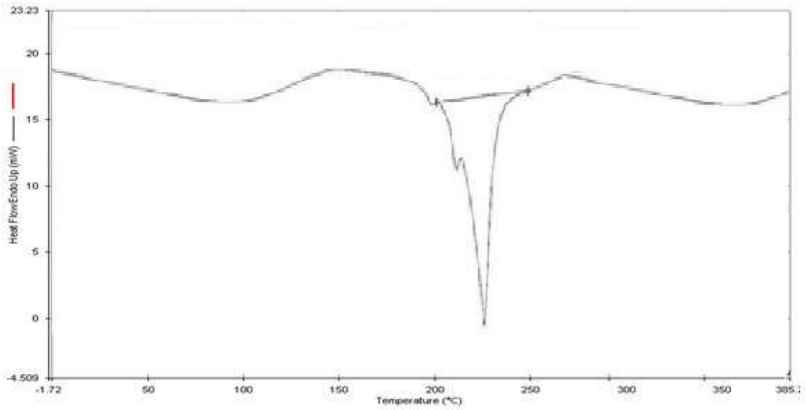

Figure 4: DSC of drug sample (S1)

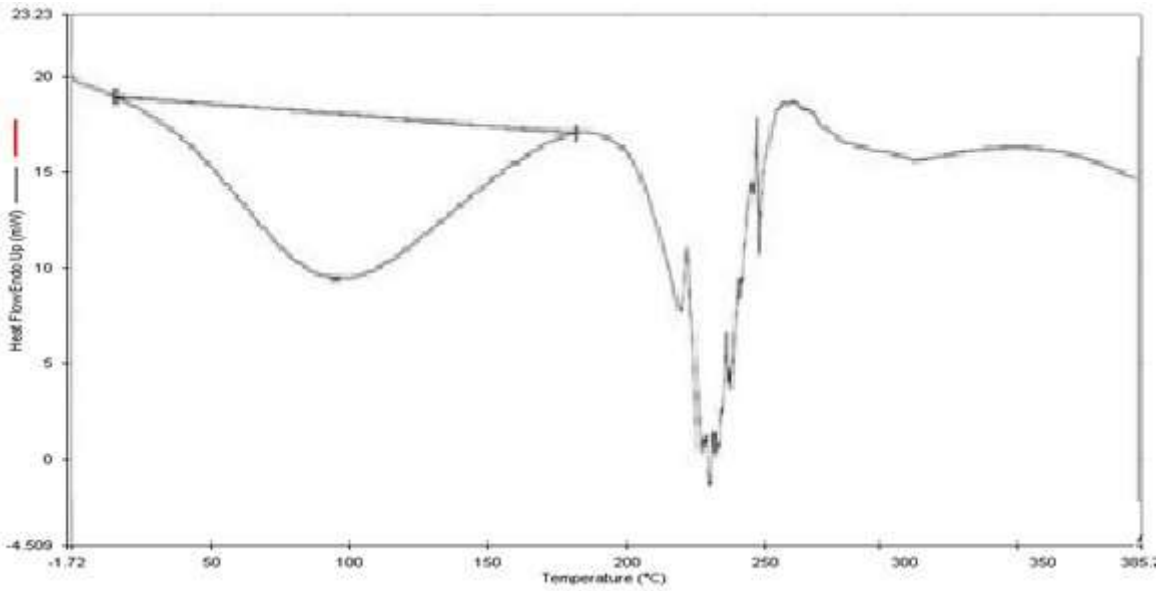

Figure 5: DSC of drug and all excipients (MSD3)

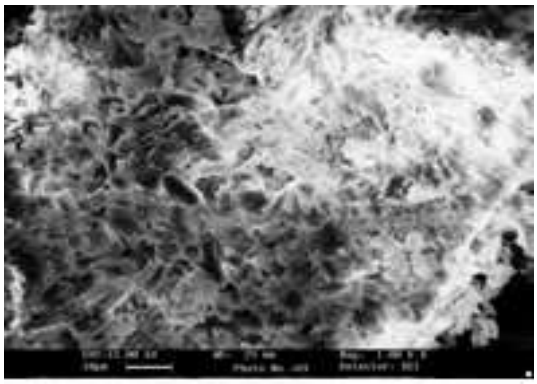

Figure 6: SEM photograph of drug sample (S1)

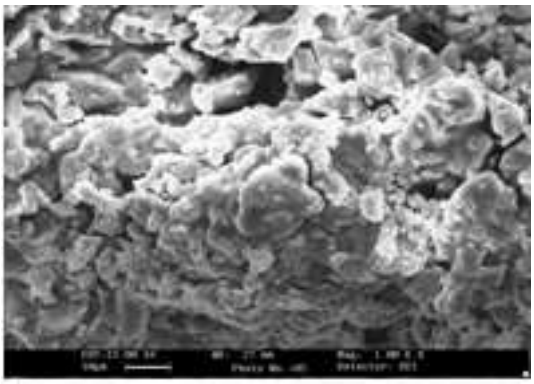

Figure 7: SEM photograph of drug and all excipients (MSD3)

Table 2: Solubility study of taste masking of meclizine hydrochloride by solid dispersion

S. No	Medium	Solubility (mg/ml)±SD*		
		Solid dispersion		
		MSD1	MSD2	MSD3
1	Distilled water	1.351±0.51	1.568±0.11	1.480±0.11
2	0.1N HCl,	0.708±0.17	0.822±0.15	0.991±0.13
3	ASA pH 6.8 Phosphate buffer	1.521±0.28	1.711±0.31	1.999±0.17
4	Phosphate buffer pH 7.4	1.432±0.17	1.611±0.18	1.718±0.11

Evaluation of Orodispersible Tablets:

Meclizine hydrochloride containing a strong dispersion powder was directly pressed to form orodispersible Tablets. Pre-compression parameters indicated that the powder mixtures had sufficient flow areas according to the permissible limits. The size of the pills was the same for each group. This has shown that the same compressive forces are applied while taking the pills. Weight loss is related to the development of powder flow structures through the addition of talc and magnesium stearate, leading to the effective filling of the Die cavity (Table 1). FMOs were generally expected to weigh 3 to 3.5 kg / cm2, as solid tablets are known to have longer dispersions. The stiffness was monitored at regular intervals during the blow to maintain the level of stiffness at the same level. Deviation from hardness will lead to differences in dispersion time. Pills were very stable for any external stress that might be involved during transport and packing: friability rates were in line with the USP limit of <1%. The results of the dispersion test, wetting time and dispersion time were less than 60 seconds, which mimics the dispersal that occurs in the mouth, consistent with the results of the USP dispersion test. The result was shown that the composition would be dissolved within minutes and followed by the need for purpose (Tables 3 - 5). Formulation FMODs3 has an excellent completion rate of 94.38% in 30 minutes. The results of in vitro decompression studies are included in zero order, first order and Korsmeyer-Peppas statistics. R2 values range from 0.862 to 0.978 (first program episode) in different constructions (Figures 8 - 11). The slope prices for the Korsmeyer-Peppas areas range from 0.949 to 0.774. The addition of solid dispersal containing the drug and mannitol (1: 3) dosage has water solubility and inflammation leading to rapid drug dispersion, which in turn leads to faster drug dispersal. Microcrystalline cellulose and mannitol in higher ratio act as superdispersible property and solubility enhancing agent. The combination of agents have more disintegrating property due to rapid water uptake and dispersion time which lead to rapid release of drug and made the dissolution faster. The results of the release kinetics study showed that all the formulations obeyed first order drug release profile more closely, i.e., the release rate depended upon the initial concentration of drug. The slope values of the Korsmeyer-Peppas plot showed that the mechanism was non-fickian or supercase II transport mechanism.

Table 3: Flow properties of matrix granules of orodispersible blends (FMODs1 – FMODs3)

Formulation code	Carr's index [n] (%)	Hausner's ratio [n]	Angle of repose (θ) [n]
FMODs1	16.11±0.002	1.17±0.011	26.1±0.011
FMODs2	15.24±0.011	1.17±0.001	24.1±0.021
FMODs3	14.13±0.013	1.15±0.028	23.8±0.012

n = 3 (mean ± Standard deviation)

Table 4: Physical characterization of orodispersible tablets (FMODs1 – FMODs3)

Formulation code	Tablet Thickness (mm)		Weight Variation (%)	Hardness (kg/cm [2])	Friability w/w (%)
	Diameter	Height			
FMODs1	8.01±0.001	2.11±0.002	2.1±0.011	3.6±0.12	0.614±0.005
FMODs2	8.02±0.002	2.04±0.011	2.2±0.031	4.1±0.19	0.515±0.002
FMODs3	8.01±0.001	2.01±0.011	2.1±0.002	4.9±0.21	0.493±0.002

n = 3 (mean ± Standard deviation)

Table 5: Physical characterization of orodispersible tablets (FMODs1 – FMODs3)

Formulation code	Drug Content (%)	Disintegration Time (sec)	Wetting time (sec)	Water absorption ratio (%)	Dispersion Time (sec)
FMODs1	99.2±0.10	51±0.01	21.01±0.09	28.11±1.02	33±0.02
FMODs2	99.1±0.05	42±0.03	16.22±0.03	23.61±1.13	31±0.01
FMODs3	99.8±0.01	31±0.03	11.00±0.03	19.31±1.42	32±0.02

n = 3 (mean ± Standard deviation)

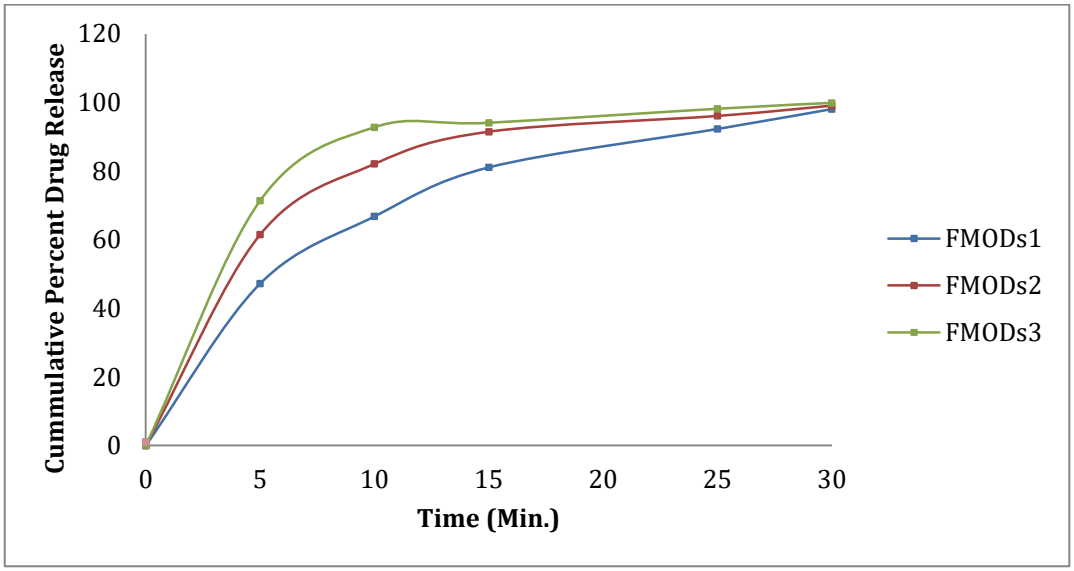

Figure 8: Zero-order plots of orodispersible tablets (FMODs1 – FMODs3)

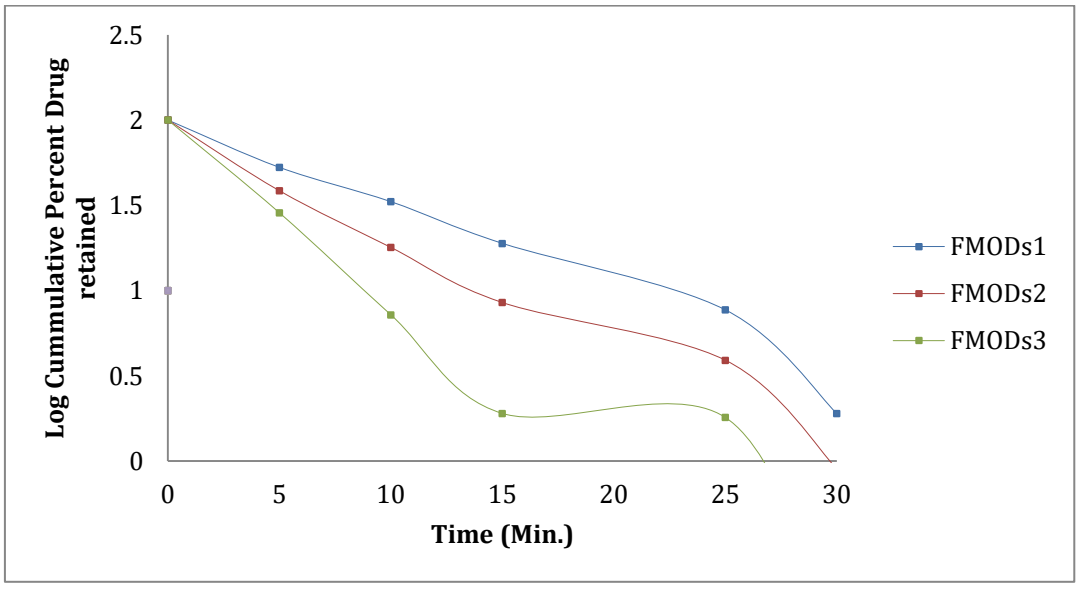

Figure 9: First-order plots of orodispersible tablets (FMODs1 – FMODs3)

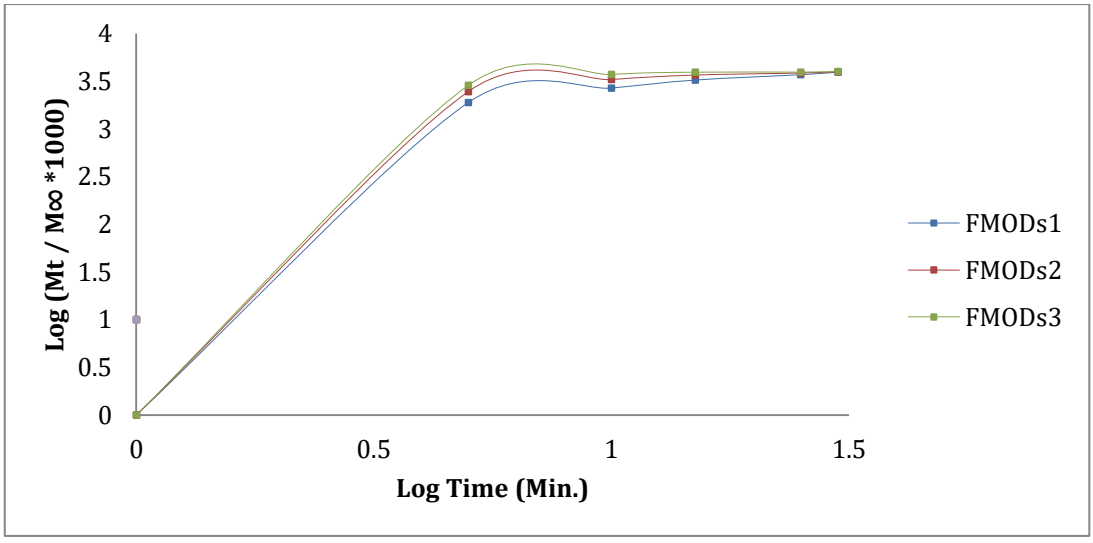

Figure 10: Korsmeyeyr's Peppas plots of orodispersible tablets (FMODs1 – FMODs3)

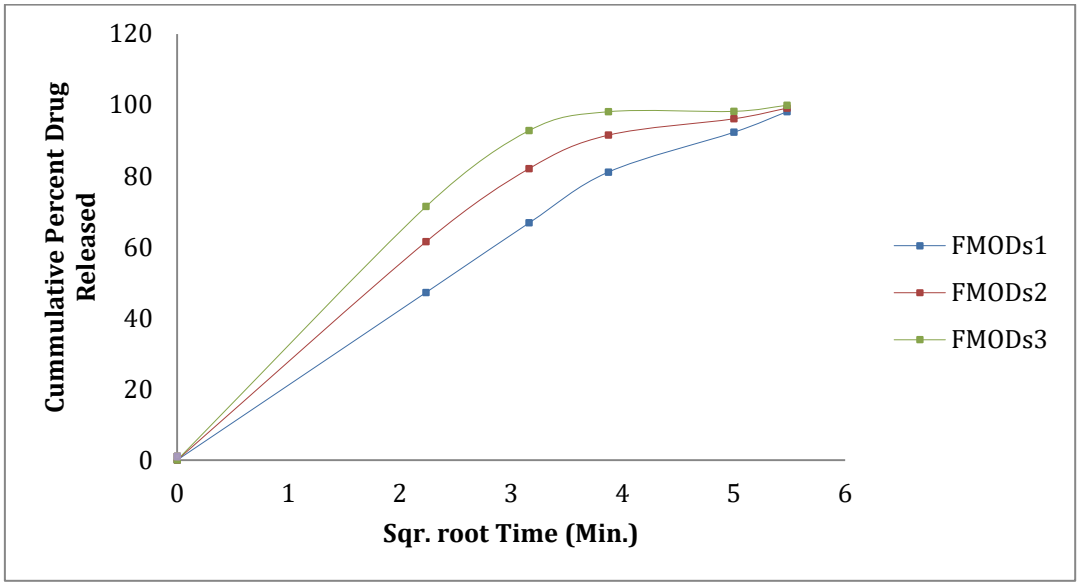

Figure 11: Higuchi plots of orodispersible tablets (FMODs1 – FMODs3)

SUMMARY AND CONCLUSION

The oro-dispersible tablet containing the formation of meclizine hydrochloride solid dispersion (FMODDs) was prepared using a natural superdisintegrant with direct compression methods. Superdisintegrants and their concentrations will be during the preparation of FMODDs containing meclizine hydrochloride by direct pressure using different excipients in different dosages including: superdisintegrants {sodium starch glycolate (SSG), Ac-Di-Sol, crosspovidone (CP), Spray dried lactose and microcrystalline cellulose (MCC)} used alone and in various combinations with mannitol, as well as lubricants and solvents. Adjusted FMODDs have shorter dispersion time, sufficient operating capacity, better patient compliance, and an acceptable stability profile using a variety of different preparation and learning methods that affect pre- and post-pressure parameters. Pre-compression parameters showed that the powder compounds had sufficient flow areas were the same and compressive strength was applied while spraying the tablets. The uniformity of the weight leading to the active filling of the death hole and the stiffness known as the long deviation causes a difference during disintegration. The hardness values were consistent and dispersed, the watering time and dispersion time were less than 90 seconds. The result was shown that the formation would be dissolved within a minute and followed by the need for purpose To design FMODs3 with the best scattering profile of 99.99% in 30 minutes. The results of the release kinetics study showed that all ingredients adhere to the drug release profile of the first order very closely, i.e., the rate of release depends on the initial combination of the drug.

REFRENCES

1. Pandya P, Gattani S, Jain P, Surana S, "Co-solvent Evaporation method for enhancement of solubility & dissolution rate of poorly aqueous soluble drug Simvastatin : In vitro-in vivo evaluation", AAPS Pharmascitech, 2008; 9: 1247-1248. https://doi.org/10.1208/s12249-008-9176-z

2. Wehling F, Steve S, Navayanarao M, 1993, Pediatric effervescent dosage form. US Patent 5223264.

3. Sohi H, Sultana Y, Khar RK, "Taste Masking Technologies in Oral Pharmaceuticals: Recent Developments and Approaches", Drug Development and Industrial Pharmacy, 2004; 30:429-448. https://doi.org/10.1081/DDC-120037477

4. Parkash V, Maan S, Deepika, Yadav SK, Hemlata, Jogpal V. Fast disintegrating tablets: Opportunity in drug delivery system. J Adv Pharm Technol Res. 2011; 2(4):223-235. https://doi.org/10.4103/2231-4040.90877

5. Hannan PA, Khan JA, Khan A, Safiullah S. Oral Dispersible System: A New Approach in Drug Delivery System. Indian J Pharm Sci. 2016; 78(1):2-7. https://doi.org/10.4103/0250-474X.180244

6. Pawar H, Varkhade C, Jadhav P, Mehra K, Development and evaluation of orodispersible tablets using a natural polysaccharide isolated from Cassia tora seeds, Integrative Medicine Research, 2014; 3:91-98. https://doi.org/10.1016/j.imr.2014.03.002

7. Elkhodairy KA, Hassan MA, Afifi SA, Formulation and optimization of orodispersible tablets of flutamide, Saudi Pharmaceutical Journal, 2014; 22:53-61. https://doi.org/10.1016/j.jsps.2013.01.009

8. Zhao Y, Quan P, Fang L, Preparation of an oral thin film containing meclizine hydrochloride: In vitro and in vivo evaluation, International Journal of Pharmaceutics, 2015; 496:314-322. https://doi.org/10.1016/j.ijpharm.2015.10.008

9. Madgulkar A, Bandivadekar M, Shid T, Rao S. Sugars as solid dispersion carrier to improve solubility and dissolution of the BCS class II drug: clotrimazole. Drug Development and Industrial Pharmacy, 2015; 23:1-11. https://doi.org/10.3109/03639045.2015.1024683

10. Oliveira LJ, Veiga A, Stofella NCF, Cunha AC, da Graça T Toledo M, Andreazza IF, Murakami FS. Development and Evaluation of Orodispersible Tablets Containing Ketoprofen. Curr Drug Deliv. 2020; 17(4): 348-360. https://doi.org/10.2174/1567201817666200317122807